Mathematical methods, models and modelling *NEW* MST210

Presentation pattern *October to June*

Module description

Students will solve real problems by finding out how they are transformed into mathematical models and learn the methods of solution. This module covers classical mechanical models as well as some non-mechanical models such as population dynamics; and methods including vector algebra, differential equations, calculus (including several variables and vector calculus), matrices, methods for three-dimensional problems, and numerical methods. Teaching is supported and enhanced by use of a computer algebra package. This module is essential for higher level study of applied mathematics. To study this module students will need a sound knowledge of mathematics as developed in *Essential mathematics 1* (MST124) and *Essential mathematics 2* (MST125) or equivalent.

Person specification

The person specification for this module should be read in conjunction with the generic person specification for an associate lecturer at The Open University.

As well as meeting all the requirements set out in the generic person specification, you should have:

- a good degree in mathematics, or a related subject that includes a significant amount of applied mathematics
- an interest in the use of computers in teaching mathematics, and experience in using a computer algebra package
- a good understanding of the mathematical methods covered in the module
- a good understanding of the mechanics covered in the module
- an interest in the application of the topics covered in the module
- an interest in the relevance of mathematics to everyday life
- experience of mathematical modelling as well as mathematical models of physical systems
- good communication skills
- good skills in assessing non-standard mathematical arguments
- an interest in building adults' confidence in the use of mathematics
- an interest in, and the ability to teach students from diverse backgrounds
- an ability to communicate with students and to support their progress on the module
- an ability to support the development of mathematical skills and study strategies in students who have different interests and aspirations
- a willingness to use elearning facilities, such as:
  - the module website, and other University websites, to download essential material and to retrieve other information
  - University systems for the purposes of monitoring students' progress
  - email and University forums for asynchronous communication with students, tutors, and other staff
  - online tutorials, as an alternative to face-to-face sessions, where appropriate
  - wikis for the promotion of group working
  - on-screen marking of electronically submitted tutor-marked assignments

It would be an advantage to have:

- experience of teaching mathematics at this level to adults or to students from a broad range of educational backgrounds
- taught applied mathematics at second level at a university
- a knowledge of the computer algebra system Maxima
- enthusiasm for mathematics and its teaching

- experience of on-screen marking of electronically-submitted tutor-marked assignments (eTMAs) at The Open University, especially in a symbolically-rich subject.

Additional information

The exact nature of e-learning facilities will evolve over the life of the module, and you will need to be prepared to adapt accordingly. Please note that, in accordance with usual University policy, tutors will be expected to use their own equipment for all aspects of e-learning. Students on this module will have the choice to submit their TMAs electronically, using the University's online TMA/EMA service. Therefore anyone appointed to tutor on this module will be required to mark and provide feedback on TMAs submitted electronically and to return the marked work as an electronic file, in the prescribed form, to the online TMA/EMA service. If you are invited for an interview and the latter involves an electronic marking exercise, some guidance will be given for this. Further information and advice will be available should you be appointed to the role.

Module related details - a full explanation can be found on the website

Credits awarded to the student for the successful completion of a module:	60
Number of assignments submitted by the student:	7
Method of submission for assignments:	3
Level of ICT requirements:	2
Number of students likely to be in a standard group:	20
Salary band:	7
Estimated number of hours per teaching week:	6